

IN THE CLAIMS

Claim 1-35 (cancelled)

36. (previously presented) A method of bioleaching a slurry containing sulphide minerals which includes the steps of subjecting the slurry in a reactor to a bioleaching process at a temperature in excess of 45 °C, supplying a feed gas which contains in excess of 85% oxygen by volume to the slurry, and controlling a dissolved oxygen concentration in the slurry at a level in a range of from $0.2 \times 10^{-3} \text{ kg/m}^3$ to $10 \times 10^{-3} \text{ kg/m}^3$ by controlling at least one of the following: the oxygen content of the feed gas, the supply of feed gas to the slurry; the rate of feed of slurry to the reactor.

37. (cancelled)

38. (previously presented) The method according to claim 36 further including determining said dissolved oxygen concentration in said slurry by using at least one of the following: directly measuring dissolved oxygen concentration in said slurry, measuring oxygen content in a gas above said slurry, and indirectly measuring oxygen content in off-gas from said slurry.

39. (previously presented) The method according to claim 36 further including the step of controlling a carbon content of the slurry.

40. (previously presented) The method according to claim 39 further including controlling said carbon content by at least one of the following: adding carbon dioxide gas to said slurry, and adding other carbonaceous material to said slurry.

41. (previously presented) The method according to claim 36 which further includes controlling a carbon dioxide content of said feed gas in a range of from 0.5% to 5.0% by volume.

42. (previously presented) The method according to claim 36 which further includes subjecting said slurry in said reactor to a bioleaching process at a temperature in a range of from 45°C to 100°C.

43. (previously presented) The method according to claim 42 wherein said temperature is in a range of from 60°C to 85°C.

44. (currently amended) The method according to claim 36 which further includes bioleaching the slurry ~~at a temperature of up to 45°C~~ using mesophile microorganisms.

45. (previously presented) The method according to claim 44 wherein said microorganisms are selected from the group comprising *Acidithiobacillus*; *Thiobacillus*; *Leptosprillum*; *Ferromicrobium*; and *Acidiphilium*.

46. (previously presented) The method according to claim 45 wherein the said microorganisms are selected from the group comprising *Acidithiobacillus caldus* (*Thiobacillus caldus*); *Acidithiobacillus thiooxidans* (*Thiobacillus thiooxidans*); *Acidithiobacillus ferrooxidans* (*Thiobacillus ferrooxidans*); *Acidithiobacillus acidophilus* (*Thiobacillus acidophilus*); *Thiobacillus prosperus*; *Leptospirillum ferrooxidans*; *Ferromicrobium acidophilus*; and *Acidiphilium cryptum*.

47. (previously presented) The method according to claim 36 further including bioleaching said slurry at a temperature of from 45°C to 60°C using moderate thermophile microorganisms.

48. (previously presented) The method according to claim 47 wherein the microorganisms are selected from the group comprising *Acidithiobacillus*; *Acidimicrobium*; *Sulfobacillus*; *Ferroplasma*; and *Alicyclobacillus*.

49. (previously presented) The method according to claim 48 wherein the said microorganisms are selected from the group comprising *Acidithiobacillus caldus*; *Acidimicrobium ferrooxidans*; *Sulfobacillus acidophilus*; *Sulfobacillus disulfidooxidans*; *Sulfobacillus thermosulfidooxidans*; *Ferroplasma acidarmanus*; *Thermoplasma acidophilum*; and *Alicyclobacillus acidocaldrius*.

50. (previously presented) The method according to claim 43 further including bioleaching said slurry at a temperature of from 60°C to 85°C using thermophilic microorganisms.

51. (previously presented) The method according to claim 50 wherein said microorganisms are selected from the group comprising *Acidothermus*; *Sulfolobus*; *Metallosphaera*; *Acidianus*; *Ferroplasma*; *Thermoplasma*; and *Picrophilus*.

52. (previously presented) The method according to claim 51 wherein the said microorganisms are selected from the group comprising *Sulfolobus metallicus*; *Sulfolobus acidocaldarius*; *Sulfolobus thermosulfidooxidans*; *Acidianus infernus*; *Metallosphaera sedula*; *Ferroplasma acidarmanus*; *Thermoplasma acidophilum*; *Thermoplasma volcanium*; and *Picrophilus oshimae*.

53. (previously presented) The method according to claim 36 wherein said reactor is substantially closed.

54. (previously presented) A bioleaching plant which includes a reactor vessel, a source which feeds a sulphide mineral slurry to the vessel wherein a bioleaching process is carried out at a temperature in excess of 45 °C, an oxygen source which supplies oxygen in the form of substantially pure oxygen to the slurry, a device which measures the dissolved oxygen concentration in the slurry in the vessel, and a control mechanism whereby, in response to the said measured dissolved oxygen concentration, the supply of oxygen from the oxygen source to the slurry is controlled to achieve a dissolved oxygen concentration in the slurry of from $0.2 \times 10^{-3} \text{ kg/m}^3$ to $10 \times 10^{-3} \text{ kg/m}^3$.

55. (previously presented) The plant according to claim 54 wherein said reactor vessel is operated at a temperature in excess of 60°C.